

## ABSTRACT

A modulator for modulating carrier wave signals with an in-phase component signal and a quadrature component signal includes a fixed frequency signal generating means for generating two fixed-frequency signals differing 90 degrees in phase, a variable frequency signal generating means for generating a signal whose frequency can be varied according to a modulated signal to be produced, an in-phase component carrier wave signal generating means for mixing one fixed-frequency signal and the variable-frequency signal to generate a carrier wave signal for an in-phase component, a quadrature component carrier wave signal generating means for mixing the other fixed-frequency signal and the variable-frequency signal to generate a carrier wave signal for a quadrature component, an in-phase component modulating means for modulating the in-phase component carrier wave signal with the in-phase component signal, and a quadrature component modulating means for modulating the quadrature component carrier wave with the quadrature component signal. A demodulator for demodulating an in-phase component modulated signal and a quadrature component modulated signal includes a fixed frequency signal generating means for generating two fixed-frequency signals differing 90 degrees in phase, a variable frequency signal generating means for generating a signal whose frequency can be varied according to a modulated signal, an in-phase component carrier wave signal generating means for mixing one fixed-frequency signal and the variable-frequency signal to generate a carrier wave signal for an in-phase component, a quadrature component carrier wave signal generating means for mixing the other fixed-frequency signal and the variable-frequency signal to generate a carrier wave signal for a quadrature component, an in-phase component demodulating means for demodulating an in-phase component modulated signal with the in-phase component carrier wave signal to produce an in-phase component signal, and a quadrature component demodulating means for demodulating a quadrature component modulated signal with the quadrature component carrier wave signal to produce a quadrature component signal.